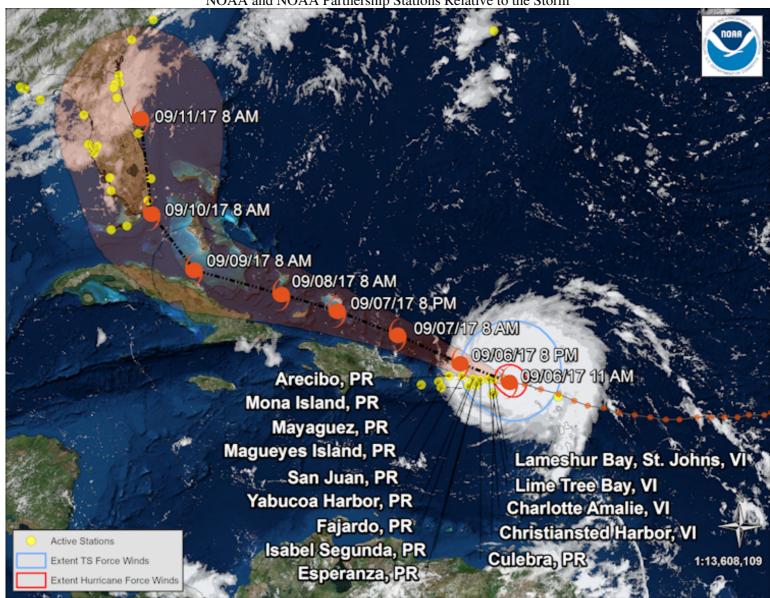


NOAA and NOAA Partnership Stations Relative to the Storm



# Storm Analysis

s of 09/06/2017 12:00 AST, water levels at locations in the U.S. Virgin Islands and Puerto Rico are slowly rising and range between 0.4 and 0.8 feet above tidal predictions. Water levels at Christianstead Harbor, VI are around 1.4 feet above tidal predictions.

Wind speeds across the U.S. Virgin Islands and Puerto Rico continue to slowly rise with speeds between 20-30 kts in the Virgin Islands with gusts up to 40 knots. Wind speeds are between 10-20 knots in Puerto Rico with gusts to 30 knots. Barometric pressure continues to fall across the region.

Water Level and Meteorological plots available below are updated automatically. A line denoting <u>Mean Higher High Water</u> (MHHW) is displayed to provide an approximate indication of when flooding inundation may occur.

For additional data, please see the <u>Center for Operational Oceanographic Products & Services</u> website. For more information or archived products and reports, please see the <u>Storm QuickLook</u> Homepage.

Analyst:ADM

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## SELECT NATIONAL HURRICANE CENTER ADVISORY INFORMATION:

Hurricane Irma Advisory Number 30 NWS National Hurricane Center Miami FL 1100 AM AST Wed Sep 06 2017

...EYE OF POTENTIALLY CATASTROPHIC CATEGORY 5 HURRICANE IRMA CLOSING IN ON THE VIRGIN ISLANDS...

#### WATCHES AND WARNINGS

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#### CHANGES WITH THIS ADVISORY:

A Hurricane Warning has been issued for the north coast of Haiti from the northern border with the Dominican Republic to Le Mole St. Nicholas. A Tropical Storm Warning has been issued for for the coast of Haiti from south of Le Mole St. Nicholas to Port-Au-Prince.

The government of France has discontinued all warnings for Guadeloupe.

The government of Antigua has discontinued all warnings for Antigua, Barbuda, St. Kitts, Nevis, and Montserrat.

#### SUMMARY OF WATCHES AND WARNINGS IN EFFECT:

A Hurricane Warning is in effect for...

- \* Anguilla
- \* Saba, St. Eustatius, and Sint Maarten
- \* Saint Martin and Saint Barthelemy
- \* British Virgin Islands
- \* U.S. Virgin Islands
- \* Puerto Rico, Vieques, and Culebra
- \* Dominican Republic from Cabo Engano to the northern border with Haiti
- \* Haiti from the northern border with the Dominican Republic to Le Mole St. Nicholas
- \* Southeastern Bahamas and the Turks and Caicos Islands

A Hurricane Watch is in effect for...

- \* Cuba from Matanzas province eastward to Guantanamo province
- \* Central Bahamas

A Tropical Storm Warning is in effect for...

- \* Dominican Republic from south of Cabo Engano westward to the southern border with Haiti
- \* Haiti from south of Le Mole St. Nicholas to Port-Au-Prince

A Hurricane Warning means that hurricane conditions are expected somewhere within the warning area. Preparations to protect life and property should be rushed to completion.

A Hurricane Watch means that hurricane conditions are possible within the watch area. A watch is typically issued 48 hours before the anticipated first occurrence of tropical-storm-force winds, conditions that make outside preparations difficult or dangerous.

A Tropical Storm Warning means that tropical storm conditions are expected somewhere within the warning area.

A Tropical Storm Watch means that tropical storm conditions are possible within the watch area, generally within 48 hours.

Interests elsewhere in the Dominican Republic and Haiti, as well as Cuba, the northwestern Bahamas, and Florida should monitor the progress of Irma.

For storm information specific to your area in the United States, including possible inland watches and warnings, please monitor products issued by your local National Weather Service forecast office. For storm information specific to your area outside the United States, please monitor products issued by your national meteorological service.

#### **DISCUSSION AND 48-HOUR OUTLOOK**

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At 1100 AM AST, the eye of Hurricane Irma was located near ABOUT 65 MI ESE OF ST. THOMAS and about 140 MI E OF SAN JUAN PUERTO RICO. Irma is moving toward the west-northwest near 16 mph, and this general motion is expected to continue for the next couple of days. On the forecast track, the extremely dangerous core of Irma will move over portions of the Virgin Islands very soon, pass near or just north of Puerto Rico this afternoon or tonight, pass near or just north of the coast of the Dominican Republic Thursday, and be near the Turks and Caicos and southeastern Bahamas late Thursday.

Maximum sustained winds are near 185 mph with higher gusts. Irma is a category 5 hurricane on the Saffir-Simpson Hurricane Wind Scale. Some fluctuations in intensity are likely during the next day or two, but Irma is forecast to remain a powerful category 4 or 5 hurricane during the next couple of days.

Hurricane-force winds extend outward up to 50 miles from the center and tropical-storm-force winds extend outward up to 185 miles.

The estimated minimum central pressure is 918 mb.

#### HAZARDS AFFECTING LAND

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STORM SURGE: The combination of a life-threatening storm surge and large breaking waves will raise water levels ABOVE NORMAL TIDE LEVELS by the following amounts within the hurricane warning area near and to the north of the center of Irma. Near the coast, the surge will be accompanied by large and destructive waves.

Northern Leeward Islands...7 to 11 ft Turks and Caicos Islands...15 to 20 ft Southeastern Bahamas...15 to 20 ft Northern coast of the Dominican Republic...3 to 5 ft Northern coast of Haiti and the Gulf of Gonave...1 to 3 ft

The combination of a life-threatening storm surge and the tide will cause normally dry areas near the coast to be flooded by rising waters moving inland from the shoreline. The water is expected to reach the following HEIGHTS ABOVE GROUND if the peak surge occurs at the time of high tide...

British and U.S. Virgin Islands except St. Croix...7 to 11 ft Northern coast of Puerto Rico...4 to 6 ft Southern coast of Puerto Rico and St. Croix...2 to 4 ft

The deepest water will occur along the immediate coast in areas of onshore winds, where the surge will be accompanied by large and destructive waves. Surge-related flooding depends on the relative timing of the surge and the tidal cycle, and can vary greatly over short distances. For information specific to your area, please see products issued by your local National Weather Service forecast office.

WIND: Hurricane conditions will continue today within the hurricane warning area in the Leeward Islands. Hurricane conditions are occurring over the British and U.S. Virgin Islands and will spread westward over portions of Puerto Rico later today. Hurricane conditions are expected to begin within the hurricane warning area in the Dominican Republic and and Haiti on Thursday, with tropical storm conditions beginning tonight. Hurricane conditions are expected in the warning area in the southeastern Bahamas and the Turks and Caicos Islands beginning Thursday night.

Hurricane and tropical storm conditions are possible within the watch area in the central Bahamas and Cuba by Friday.

RAINFALL: Irma is expected to produce the following rain accumulations through Saturday:

Northern Leeward Islands...8 to 12 inches, isolated 20 inches
Northeast Puerto Rico and the British and U.S. Virgin Islands...4 to 10 inches, isolated 15 inches
Southwest Puerto Rico, the southern Leeward Islands, and Saint
Croix...2 to 4 inches
Southeast Bahamas and Turks and Caicos...8 to 12 inches, isolated 20 inches

Northern Dominican Republic, northern Haiti, eastern and central Cuba...4 to 10 inches, isolated 15 inches Southwest Haiti...1 to 4 inches

In all areas this rainfall may cause life-threatening flash floods and mudslides.

SURF: Swells generated by Irma will affect the northern Leeward Islands, Puerto Rico, the Virgin Islands, the southeastern Bahamas, the Turks and Caicos Islands, the northern coast of the Dominican Republic, and portions of the southeast coast of the United States during the next several days. These swells are likely to cause life-threatening surf and rip current conditions. Please consult products from your local weather office.

#### **NEXT ADVISORY**

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Next intermediate advisory at 200 PM AST. Next complete advisory at 500 PM AST. For the purpose of timely release, data contained within this QuickLook have undergone a "limited" NOS Quality Assurance/Control; however, the data have not yet undergone final verification. All data subject to NOS verification.

Jump to: Christiansted Harbor, St Croix - Water Level, Christiansted Harbor, St Croix - Winds, Christiansted Harbor, St Croix - Barometric, Lameshur Bay, St John - Water Level, Lime Tree Bay. St. Croix - Water Level, Lime Tree Bay. St. Croix - Water Level, Lime Tree Bay. St. Croix - Water Level, Charlotte Amalie - Winds, Culebra - Water Level, Isabel Segunda, Vieques Island - Water Level, Isabel Segunda, Vieques Island - Winds, Esperanza, Vieques Island - Winds, Fajardo - Water Level, Fajardo - Winds, Yabucoa Harbor - Water Level, Yabucoa Harbor - Winds, San Juan, La Puntilla, San Juan Bay - Water Level, San Juan, La Puntilla, San Juan Bay - Water Level, Magueyes Island - Winds, Mayaguez - Water Level, Magueyes Island - Water Level, Magueyes Island - Water Level, Mayaguez - Water Level

# NOAA/NOS/CO-OPS 9751364 Christiansted Harbor, St Croix, VI

09/05

12:00

Predicted Tide

Observed WL

09/05

00:00

09/04

12:00

Last Observed Sample: 09/06/2017 11:30 (AST). Data relative to MHHW Observed: 1.18 ft. Predicted: -0.34 ft. Residual: 1.52 ft. Historical Maximum Water Level: Oct 16 2008, 1.17 ft. Next High Tide: 09/06/2017 20:53 (AST), 0.13 ft.

09/06

00:00

09/07

00:00

09/06

12:00

(Obs-Pred) MHHW

# NOAA/NOS/CO-OPS 9751364 Christiansted Harbor, St Croix, VI

Wind Speed / Gusts / Direction 360 50 40 270 direction (true) speed (knots) 30 180 20 90 10 0 0 09/05 09/04 09/05 09/06 09/06 09/07 12:00 00:00 12:00 12:00 00:00 00:00 direction speed gusts

Last Observed Sample: 09/06/2017 11:30 (AST) Wind Speed: 24 knots Gusts: 37 knots Direction: 309° T

### NOAA/NOS/CO-OPS 9751364 Christiansted Harbor, St Croix, VI

#### Barometric Pressure 1014 1012 1010 1008 Pressure 1006 1004 1002 1000 998 09/04 09/05 09/05 09/06 09/06 09/07 12:00 00:00 12:00 00:00 12:00 00:00 barometric pressure

Last Observed Sample: 09/06/2017 11:30 (AST)
Barometric Pressure: 996.6 mb

### NOAA/NOS/CO-OPS 9751381 Lameshur Bay, St John, VI

Preliminary Water Level, relative to Mean Higher High Water(MHHW)

1.4 1.2 1.0 0.8 Feet 0.6 0.4 ä 0.2 0.0 -0.2 -0.4-0.6 09/04 09/05 09/05 09/06 09/06 09/07 12:00 00:00 12:00 00:00 12:00 00:00 Predicted Tide (Obs-Pred)

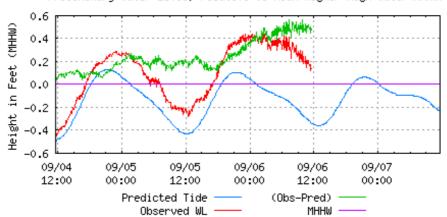
Last Observed Sample: 09/06/2017 11:36 (AST). Data relative to MHHW Observed: 0.64 ft. Predicted: -0.34 ft. Residual: 0.98 ft. Historical Maximum Water Level: Aug 30 2010, 0.89 ft. Next High Tide: 09/06/2017 21:26 (AST), 0.12 ft.

MHHW

Observed WL

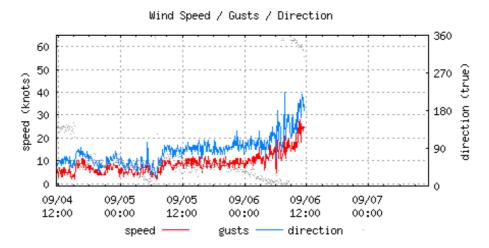
### NOAA/NOS/CO-OPS 9751401 Lime Tree Bay. St. Croix, VI

Preliminary Water Level, relative to Mean Higher High Water(MHHW)



Last Observed Sample: 09/06/2017 11:30 (AST). Data relative to MHHW Observed: 0.14 ft. Predicted: -0.34 ft. Residual: 0.48 ft. Historical Maximum Water Level: Nov 17 1999, 1.88 ft. Next High Tide: 09/06/2017 21:27 (AST), 0.07 ft.

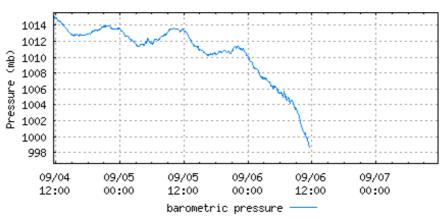
# NOAA/NOS/CO-OPS 9751401 Lime Tree Bay. St. Croix, VI



Last Observed Sample: 09/06/2017 11:30 (AST) Wind Speed: 25 knots Gusts: 32 knots Direction: 310° T

# NOAA/NOS/CO-OPS 9751401 Lime Tree Bay. St. Croix, VI

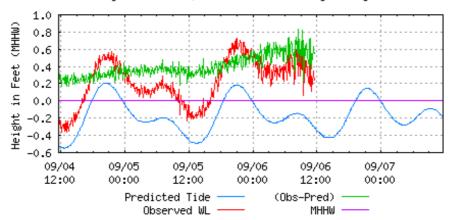
#### Barometric Pressure



Last Observed Sample: 09/06/2017 11:30 (AST)
Barometric Pressure: 998.6 mb

### NOAA/NOS/CO-OPS 9751639 Charlotte Amalie, VI

Preliminary Water Level, relative to Mean Higher High Water(MHHW)



Last Observed Sample: 09/06/2017 11:30 (AST). Data relative to MHHW Observed: 0.24 ft. Predicted: -0.31 ft. Residual: 0.55 ft. Historical Maximum Water Level: Sep 16 1995, 2.93 ft. Next High Tide: 09/06/2017 21:24 (AST), 0.14 ft.

## NOAA/NOS/CO-OPS 9751639 Charlotte Amalie, VI

Wind Speed / Gusts / Direction 360 60 50 270 direction (true) speed (knots) 40 180 30 20 90 10 0 09/04 09/05 09/06 09/06 09/07 12:00 00:00 12:00 00:00 12:00 00:00 gusts direction

Last Observed Sample: 09/06/2017 11:30 (AST) Wind Speed: 26 knots Gusts: 64 knots Direction: 294° T

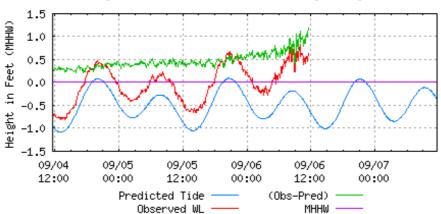
### NOAA/NOS/CO-OPS 9752235 Culebra, PR

Preliminary Water Level, relative to Mean Higher High Water(MHHW) 1.0 0.8 Feet (MHHW) 0.6 0.4 0.2 0.0 in -0.2 -0.4-0.6 -0.8 -1.0 09/04 09/05 09/05 09/06 09/06 09/07 12:00 00:00 12:00 00:00 12:00 00:00 Predicted Tide (Obs-Pred) Observed WL MHHW

Last Observed Sample: 09/06/2017 11:30 (AST). Data relative to MHHW Observed: 0.38 ft. Predicted: -0.50 ft. Residual: 0.88 ft. Historical Maximum Water Level: Nov 6 2006, 0.84 ft. Next High Tide: 09/06/2017 21:06 (AST), 0.13 ft.

# NOAA/NOS/CO-OPS 9752619 Isabel Segunda, Viegues Island, PR

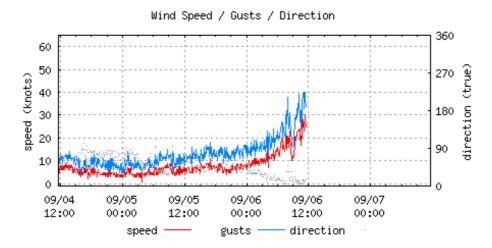
Preliminary Water Level, relative to Mean Higher High Water(MHHW)



Last Observed Sample: 09/06/2017 11:36 (AST). Data relative to MHHW Observed: 0.34 ft. Predicted: -0.58 ft. Residual: 0.92 ft.

Historical Maximum Water Level: n/a Next High Tide: 09/06/2017 21:11 (AST), 0.07 ft.

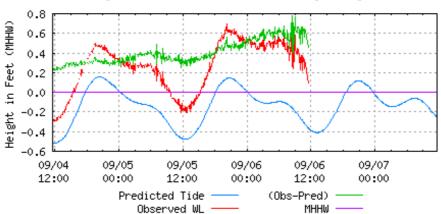
# NOAA/NOS/CO-OPS 9752619 Isabel Segunda, Vieques Island, PR



Last Observed Sample: 09/06/2017 11:36 (AST) Wind Speed: 28 knots Gusts: 39 knots Direction: 14° T

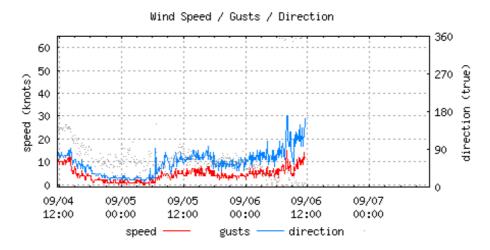
# NOAA/NOS/CO-OPS 9752695 Esperanza, Viegues Island, PR

Preliminary Water Level, relative to Mean Higher High Water(MHHW)



Last Observed Sample: 09/06/2017 11:36 (AST). Data relative to MHHW Observed: 0.23 ft. Predicted: -0.37 ft. Residual: 0.60 ft. Historical Maximum Water Level: Aug 22 2011, 0.99 ft. Next High Tide: 09/06/2017 20:54 (AST), 0.12 ft.

# NOAA/NOS/CO-OPS 9752695 Esperanza, Viegues Island, PR



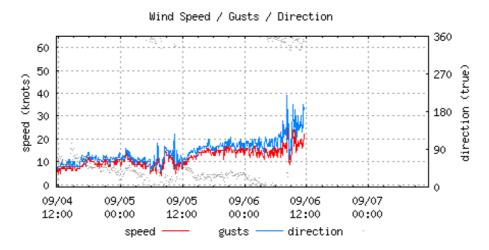
Last Observed Sample: 09/06/2017 11:36 (AST) Wind Speed: 14 knots Gusts: 24 knots Direction: 8° T

## NOAA/NOS/CO-OPS 9753216 Fajardo, PR

Preliminary Water Level, relative to Mean Higher High Water(MHHW) 1.5 Height in Feet (MHHW) 1.0 0.5 0.0 -0.5 -1.0 -1.5 09/07 09/04 09/05 09/05 09/06 09/06 12:00 00:00 12:00 00:00 12:00 00:00 Predicted Tide (Obs-Pred) Observed WL MHHW

Last Observed Sample: 09/06/2017 11:36 (AST). Data relative to MHHW Observed: 0.29 ft. Predicted: -0.74 ft. Residual: 1.03 ft. Historical Maximum Water Level: Aug 30 2010, 0.84 ft. Next High Tide: 09/06/2017 21:02 (AST), 0.07 ft.

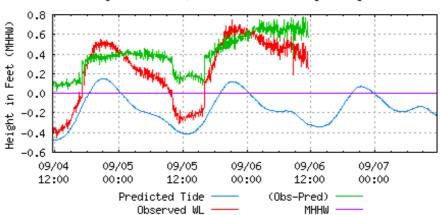
# NOAA/NOS/CO-OPS 9753216 Fajardo, PR



Last Observed Sample: 09/06/2017 11:36 (AST) Wind Speed: 21 knots Gusts: 32 knots Direction: 345° T

### NOAA/NOS/CO-OPS 9754228 Yabucoa Harbor, PR

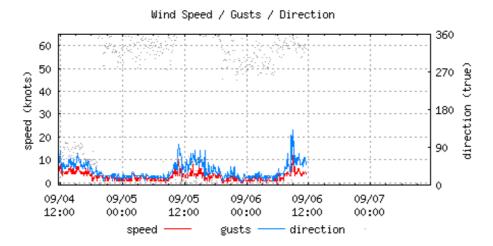
Preliminary Water Level, relative to Mean Higher High Water(MHHW)



Last Observed Sample: 09/06/2017 11:36 (AST). Data relative to MHHW Observed: 0.33 ft. Predicted: -0.32 ft. Residual: 0.65 ft.

Historical Maximum Water Level: n/a Next High Tide: 09/06/2017 21:24 (AST), 0.07 ft.

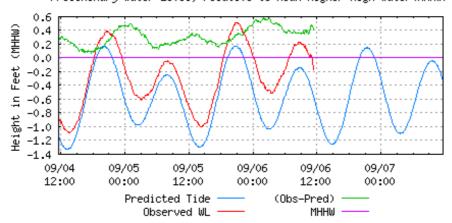
# NOAA/NOS/CO-OPS 9754228 Yabucoa Harbor, PR



Last Observed Sample: 09/06/2017 11:36 (AST) Wind Speed: 4 knots Gusts: 9 knots Direction: 319° T

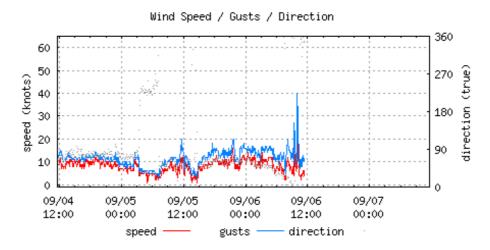
# NOAA/NOS/CO-OPS 9755371 San Juan, La Puntilla, San Juan Bay, PR

Preliminary Water Level, relative to Mean Higher High Water(MHHW)



Last Observed Sample: 09/06/2017 11:30 (AST). Data relative to MHHW Observed: -0.17 ft. Predicted: -0.60 ft. Residual: 0.43 ft. Historical Maximum Water Level: Sep 18 1989, 2.77 ft. Next High Tide: 09/06/2017 21:22 (AST), 0.15 ft.

# NOAA/NOS/CO-OPS 9755371 San Juan, La Puntilla, San Juan Bay, PR



Last Observed Sample: 09/06/2017 11:30 (AST) Wind Speed: 5 knots Gusts: 11 knots Direction: 354° T

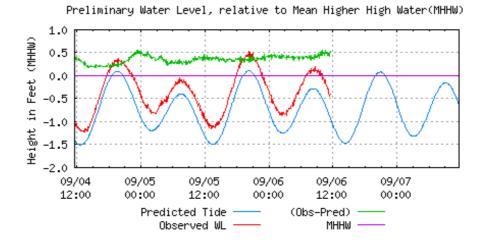
# NOAA/NOS/CO-OPS 9755371 San Juan, La Puntilla, San Juan Bay, PR

#### Barometric Pressure 1014 1012 Pressure (mb) 1010 1008 1006 1004 1002 1000 998 09/04 09/05 09/05 09/06 09/06 09/07 12:00 00:00 12:00 00:00 00:00 12:00

Last Observed Sample: 09/06/2017 11:30 (AST)
Barometric Pressure: 1008.9 mb

barometric pressure

### NOAA/NOS/CO-OPS 9757809 Arecibo, PR



Last Observed Sample: 09/06/2017 11:36 (AST). Data relative to MHHW Observed: -0.53 ft. Predicted: -0.96 ft. Residual: 0.43 ft. Historical Maximum Water Level: Oct 8 2010, 0.90 ft. Next High Tide: 09/06/2017 20:51 (AST), 0.08 ft.

### NOAA/NOS/CO-OPS 9757809 Arecibo, PR

Wind Speed / Gusts / Direction 360 60 50 270 direction (true) speed (knots) 40 180 30 20 90 10 0 09/04 09/05 09/05 09/06 09/06 09/07 12:00 00:00 12:00 00:00 12:00 00:00 speed gusts direction

Last Observed Sample: 09/06/2017 11:36 (AST) Wind Speed: 17 knots Gusts: 22 knots Direction: 44° T

### NOAA/NOS/CO-OPS 9759110 Magueyes Island, PR

Preliminary Water Level, relative to Mean Higher High Water(MHHW) 0.6 0.5 Feet (MHHW) 0.4 0.3 0.2 0.1 ä 0.0 -0.1 -0.2 -0.3 -0.4 09/04 09/05 09/05 09/06 09/06 09/07 12:00 00:00 00:00 00:00 12:00 12:00 Predicted Tide (Obs-Pred) Observed WL MHHW

Last Observed Sample: 09/06/2017 11:30 (AST). Data relative to MHHW Observed: 0.06 ft. Predicted: -0.26 ft. Residual: 0.32 ft. Historical Maximum Water Level: Sep 22 1998, 1.60 ft. Next High Tide: 09/06/2017 21:35 (AST), 0.13 ft.

# NOAA/NOS/CO-OPS 9759110 Magueves Island, PR

Wind Speed / Gusts / Direction 360 60 50 270 direction (true) speed (knots) 40 180 30 20 90 10 0 09/04 09/06 09/07 12:00 00:00 00:00 12:00 00:00 12:00

Last Observed Sample: 09/06/2017 11:30 (AST) Wind Speed: 16 knots Gusts: 22 knots Direction: 16° T

gusts -

speed

direction

### NOAA/NOS/CO-OPS 9759394 Mayaguez, PR

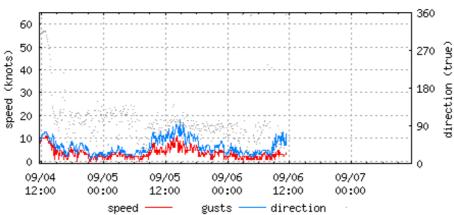
Preliminary Water Level, relative to Mean Higher High Water(MHHW) 0.8 0.6 Feet (MHHW) and market week 0.4 0.2 0.0 -0.2 -0.4 -0.6 -0.8 -1.0 -1.2 09/04 09/05 09/05 09/06 09/06 09/07 12:00 00:00 12:00 00:00 12:00 00:00 Predicted Tide (Obs-Pred) Observed WL MHHW

Last Observed Sample: 09/06/2017 11:30 (AST). Data relative to MHHW Observed: -0.10 ft. Predicted: -0.56 ft. Residual: 0.46 ft. Historical Maximum Water Level: n/a

Next High Tide: 09/06/2017 21:02 (AST), 0.15 ft.

## NOAA/NOS/CO-OPS 9759394 Mayaguez, PR

Wind Speed / Gusts / Direction



Last Observed Sample: 09/06/2017 11:30 (AST) Wind Speed: 3 knots Gusts: 7 knots Direction: 73° T

### NOAA/NOS/CO-OPS 9759938 Mona Island, PR

Preliminary Water Level, relative to Mean Higher High Water(MHHW) 0.8 Height in Feet (MHHW) 0.6 0.4 0.2 0.0 -0.2 -0.4 -0.6 09/04 09/05 09/05 09/06 09/06 09/07 12:00 00:00 12:00 00:00 12:00 00:00 Predicted Tide (Obs-Pred) Observed WL MHHW

Last Observed Sample: 09/06/2017 11:36 (AST). Data relative to MHHW Observed: 0.05 ft. Predicted: -0.43 ft. Residual: 0.48 ft. Historical Maximum Water Level: Dec 23 2010, 1.24 ft. Next High Tide: 09/06/2017 21:02 (AST), 0.07 ft.

Latest Water Level Observations on MHHW

Station ID	Station Name	Date/Time	Observed Water Level	Predicted Tide	Residual Water Level	24 Hour Maximum Storm Tide
9751364	Christiansted Harbor, St Croix, VI	09/06/2017 11:30 (AST)	1.18 ft	-0.34 ft	1.52 ft	1.18 ft
9751381	Lameshur Bay, St John, VI	09/06/2017 11:36 (AST)	0.64 ft	-0.34 ft	0.98 ft	0.95 ft
9751401	Lime Tree Bay. St. Croix, VI	09/06/2017 11:30 (AST)	0.14 ft	-0.34 ft	0.48 ft	0.46 ft
9751639	Charlotte Amalie, VI	09/06/2017 11:30 (AST)	0.24 ft	-0.31 ft	0.55 ft	0.72 ft
9752235	Culebra, PR	09/06/2017 11:30 (AST)	0.38 ft	-0.50 ft	0.88 ft	0.70 ft
9752619	Isabel Segunda, Vieques Island, PR	09/06/2017 11:36 (AST)	0.34 ft	-0.58 ft	0.92 ft	0.83 ft
9752695	Esperanza, Vieques Island, PR	09/06/2017 11:36 (AST)	0.23 ft	-0.37 ft	0.60 ft	0.70 ft
9753216	Fajardo, PR	09/06/2017 11:36 (AST)	0.29 ft	-0.74 ft	1.03 ft	0.96 ft
9754228	Yabucoa Harbor, PR	09/06/2017 11:36 (AST)	0.33 ft	-0.32 ft	0.65 ft	0.74 ft
9755371	San Juan, La Puntilla, San Juan Bay, PR	09/06/2017 11:30 (AST)	-0.17 ft	-0.60 ft	0.43 ft	0.52 ft
9757809	Arecibo, PR	09/06/2017 11:36 (AST)	-0.53 ft	-0.96 ft	0.43 ft	0.53 ft
9759110	Magueyes Island, PR	09/06/2017 11:30 (AST)	0.06 ft	-0.26 ft	0.32 ft	0.48 ft
9759394	Mayaguez, PR	09/06/2017 11:30 (AST)	-0.10 ft	-0.56 ft	0.46 ft	0.68 ft
9759938	Mona Island, PR	09/06/2017 11:36 (AST)	0.05 ft	-0.43 ft	0.48 ft	0.72 ft

Center for Operational Oceanographic Products & Services (CO-OPS) | National Ocean Service (NOS) National Oceanic and Atmospheric Administration | U.S. Department of Commerce